

REVISIONS

LTR	DESCRIPTION	DATE (YR-MO-DA)	APPROVED
E	Convert to military drawing format. Add vendor CAGE 23223. Table II, delete I_{CC} minimum limits.	87-11-23	W. Heckman
F	Add vendor CAGE 34031. Table I, change test condition R_L and I_{OUT} test. Editorial changes throughout.	89-01-11	W. Heckman
G	Changed to reflect MIL-H-38534 processing. Removed vendor CAGE 63071. Editorial changes throughout.	90-01-05	W. Heckman
H	Table I, changed SR test to +SR and -SR tests. Editorial changes throughout. Remove CAGE numbers 29832 and 34031.	92-03-16	Alan Barone
J	Changes in accordance with NOR 5962-R196-93.	93-06-25	K. A. Cottongim
K	Add CAGE code 51651 and method 1030 to paragraph 4.2. Change Figure 1, dimension A minimum. Rewrite entire document.	95-09-29	K. A. Cottongim

THE ORIGINAL FIRST PAGE OF THIS DRAWING HAS BEEN REPLACED.

CURRENT CAGE CODE 67268

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REV STATUS OF SHEETS				REV			K	K	K	K	K	K	K	K															
				SHEET			1	2	3	4	5	6	7	8															
PMIC N/A				PREPARED BY C. R. Jackson						DEFENSE ELECTRONICS SUPPLY CENTER DAYTON, OHIO 45444																			
STANDARD MICROCIRCUIT DRAWING THIS DRAWING IS AVAILABLE FOR USE BY ALL DEPARTMENTS AND AGENCIES OF THE DEPARTMENT OF DEFENSE AMSC N/A				CHECKED BY William E. Shoup																									
				APPROVED BY N. A. Hauck																									
				DRAWING APPROVAL DATE 80-12-22																									
				REVISION LEVEL K																									
										SIZE A		CAGE CODE 67268		80014															
										SHEET 1 OF 8																			

DESC FORM 193
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DISTRIBUTION STATEMENT A. Approved for public release; distribution is unlimited.

5962-E315-95

1. SCOPE

1.1 Scope. This drawing describes device requirements for class H hybrid microcircuits to be processed in accordance with MIL-H-38534.

1.2 Part or Identifying Number (PIN). The complete PIN shall be as shown in the following example:

<u>80014</u>	<u>01</u>	<u>Z</u>	<u>X</u>
Drawing number	Device type (See 1.2.1)	Case outline (See 1.2.2)	Lead finish per (See 1.2.3)

1.2.1 Device type(s). The device type(s) shall identify the circuit function as follows:

<u>Device type</u>	<u>Generic number</u>	<u>Circuit function</u>
01	0033	Voltage follower/buffer amplifier with FET input

1.2.2 Case outline(s). The case outline(s) shall be as designated in MIL-STD-1835 and as follows:

<u>Outline letter</u>	<u>Descriptive designator</u>	<u>Terminals</u>	<u>Package style</u>
Z	See figure 1	12	Can package

1.2.3 Lead finish. The lead finish shall be as specified in MIL-H-38534. Finish letter "X" shall not be marked on the microcircuit or its packaging. The "X" designation is for use in specifications when lead finishes A, B, and C are considered acceptable and interchangeable without preference.

1.3 Absolute maximum ratings.

Supply voltage range	±40 V dc maximum
Input voltage range	±40 V dc
Storage temperature range	-65° C to +150° C
Maximum power dissipation (P _D)	1.5 W 1/ 2/
Lead temperature (soldering, 10 seconds)	+300° C
Junction temperature (T _J)	+175° C

1.4 Recommended operating conditions.

Ambient operating temperature range (T _A)	-55° C to +125° C
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2. APPLICABLE DOCUMENTS

2.1 Government specification and standards. Unless otherwise specified, the following specification and standards of the issue listed in that issue of the Department of Defense Index of Specifications and Standards specified in the solicitation, form a part of this drawing to the extent specified herein.

SPECIFICATION

MILITARY

MIL-H-38534 - Hybrid Microcircuits, General Specification for.

1/ No heat sink.

2/ Derate 10 mW/° C above +25° C ambient.

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STANDARDS

MILITARY

MIL-STD-883 - Test Methods and Procedures for Microelectronics.
MIL-STD-1835 - Microcircuit Case Outlines.

(Copies of the specification and standards required by manufacturers in connection with specific acquisition functions should be obtained from the contracting activity or as directed by the contracting activity.)

3. REQUIREMENTS

3.1 Item requirements. The individual item requirements shall be in accordance with MIL-H-38534 and as specified herein.

3.2 Design, construction, and physical dimensions. The design, construction, and physical dimensions shall be as specified in MIL-H-38534 and herein.

3.2.1 Case outline(s). The case outline(s) shall be in accordance with figure 1 and 1.2.2 herein.

3.2.2 Terminal connections. The terminal connections shall be as specified on figure 1.

3.3 Electrical performance characteristics. Unless otherwise specified herein, the electrical performance characteristics are as specified in table I and shall apply over the full specified operating temperature range.

3.4 Electrical test requirements. The electrical test requirements shall be the subgroups specified in table II. The electrical tests for each subgroup are described in table I.

3.5 Marking. Marking shall be in accordance with MIL-H-38534. The part shall be marked with the PIN listed in 1.2 herein. In addition, the manufacturer's PIN may also be marked as listed in QML-38534 (see 6.6 herein).

3.6 Manufacturer eligibility. In addition to the general requirements of MIL-H-38534, the manufacturer of the part described herein shall maintain the electrical test data (variables format) from the initial quality conformance inspection group A lot sample, produced on the certified line, for each device type listed herein. The data should also include a summary of all parameters manually tested, and for those which, if any, are guaranteed. This data shall be maintained under document revision level control by the manufacturer and be made available to the preparing activity (DESC-EC) upon request.

3.7 Certificate of compliance. A certificate of compliance shall be required from a manufacturer in order to be listed as an approved source of supply in QML-38534 (see 6.6 herein). The certificate of compliance submitted to DESC-EC prior to listing as an approved source of supply shall affirm that the manufacturer's product meets the requirements of MIL-H-38534 and the requirements herein.

3.8 Certificate of conformance. A certificate of conformance as required in MIL-H-38534 shall be provided with each lot of microcircuits delivered to this drawing.

4. QUALITY ASSURANCE PROVISIONS

4.1 Sampling and inspection. Sampling and inspection procedures shall be in accordance with MIL-H-38534.

4.2 Screening. Screening shall be in accordance with MIL-H-38534. The following additional criteria shall apply:

a. Preseal burn-in test, method 1030 of MIL-STD-883.

(1) Test condition C or D. The test circuit shall be maintained by the manufacturer under document revision level control and shall be made available to either DESC-EC or the acquiring activity upon request. Also, the test circuit shall specify the inputs, outputs, biases, and power dissipation, as applicable, in accordance with the intent specified in test method 1030 of MIL-STD-883.

(2) T_A as specified in accordance with table I of method 1015 of MIL-STD-883.

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TABLE I. Electrical performance characteristics.

Test	Symbol	Conditions $-55^{\circ}\text{C} \leq T_A \leq +125^{\circ}\text{C}$ unless otherwise specified	Group A subgroups	Limits		Unit
				Min	Max	
Output offset voltage	V_{OO}	$R_S = 100\text{ k}\Omega$	1		± 10	mV
			2, 3		± 15	mV
Temperature coefficient of V_{OO}	$\%V_{OO}/\Delta T$		1, 2, 3		250	$\mu\text{V}/^{\circ}\text{C}$
Voltage gain	A_V	$V_{IN} = 1\text{ V}_{\text{RMS}}, R_L = 1\text{ k}\Omega,$ $R_S = 100\text{ k}\Omega$	1, 2, 3	0.97	1.0	V/V
Output voltage swing	$V_{OUT(1)}$	$R_L = 1\text{ k}\Omega$	1, 2, 3	± 12		V
Output voltage swing	$V_{OUT(2)}$	$R_L = 100\Omega$	1, 2, 3	± 9		V
Supply current	I_{CC}	$T_A = +25^{\circ}\text{C}$	1		22	mA
Input bias current	I_{IB}		1		<u>2</u> /	nA
			2, 3		10	nA
Output impedance	R_{OUT}	$V_{IN} = 1\text{ V}_{\text{RMS}},$ $100\Omega \leq R_L \leq 1\text{ k}\Omega$ $\pm 1\text{ mA} \leq I_{OUT} \leq \pm 10\text{ mA},$ $T_A = +25^{\circ}\text{C}$	4		10	Ω
Input impedance	R_{IN}	$T_A = +25^{\circ}\text{C}$ <u>3</u> /	4	10^{10}		Ω
Positive slew rate	+SR	$V_{IN} = \pm 10\text{ V}, R_S = 50\Omega,$ $R_L = 1\text{ k}\Omega$ <u>4</u> /	4	1000		V/ μs
			5, 6	500		
Negative slew rate	-SR	$V_{IN} = \pm 10\text{ V}, R_S = 50\Omega,$ $R_L = 1\text{ k}\Omega$ <u>4</u> /	4, 5, 6	500		V/ μs
Power consumption		$V_{IN} = 0$ <u>3</u> / $T_A = +25^{\circ}\text{C}$	1		660	mW

1/ $V_{C+} = V_+ = +15\text{ V}, V_{C-} = V_- = -15\text{ V}$, unless otherwise specified.

2/ Normal limit is 2.5 nA. However, under pulse test conditions, limit is .25 nA.

3/ Tested go/no-go only.

4/ Subgroups 5 and 6 for (+SR) and subgroups 4, 5, and 6 for (-SR) shall be tested for initial device characterization and after design or process changes that affect these parameters, therefore shall be guaranteed to the limits specified in table I.

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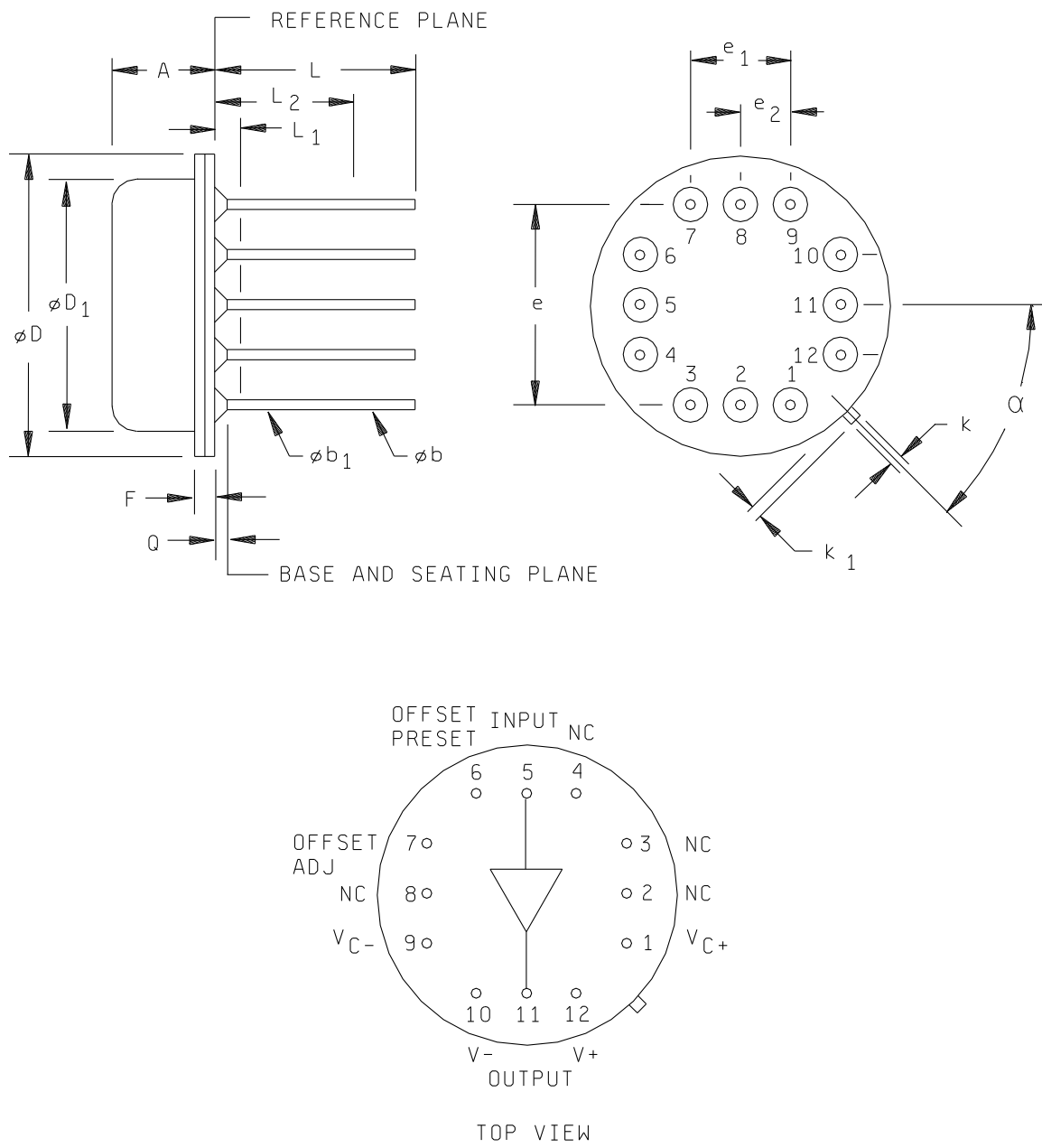


FIGURE 1. Case outline Z (12-lead can), and terminal connections.

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Dimensions					
Symbol	Inches		Millimeters		Notes
	Min	Max	Min	Max	
A	.130	.181	3.30	4.60	
ϕb	.016	.019	0.41	0.48	3, 7
ϕb_1	.016	.021	0.41	0.53	3, 7
ϕD	.595	.610	15.11	15.49	
ϕD_1	.545	.555	13.84	14.10	
e	.400 BSC		10.16 BSC		5
e ₁	.200 BSC		5.08 BSC		5
e ₂	.100 BSC		2.54 BSC		5

Dimensions					
Symbol	Inches		Millimeters		Notes
	Min	Max	Min	Max	
F	.022	.030	0.56	0.76	
k	.026	.036	0.66	0.91	
k ₁	.026	.036	0.66	0.91	4
L	.500	.560	12.70	14.22	3
L ₁	---	.050	---	1.27	3
L ₂	.250	---	6.35	---	3
Q	---	.045	---	1.14	
α	45° BSC		45° BSC		5

NOTES:

1. Dimensions are in inches.
2. Metric equivalents are given for general information only.
3. All leads: ϕb applies between L₁ and L₂. ϕb_1 applies between L₂ and .500 (12.70 mm) from the reference plane. Diameter is uncontrolled in L₁ and beyond .500 (12.70 mm) from the reference plane.
4. Measured from the maximum diameter of the product.
5. Leads having a maximum diameter of .019 (0.48 mm) measured in gauging plane .054 (1.37 mm) +.001 (0.03 mm), -.000 (0.00 mm) below the base plane of the product shall be within .007 (0.18 mm) of their true position relative to a maximum width tab.
6. The product may be measured by direct methods or by gauge.
7. All leads: Increase maximum limit by .003 (0.08 mm) when lead finish A is applied.

FIGURE 1. Case outline Z (12-lead can), and terminal connections - Continued.

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TABLE II. Electrical test requirements.

MIL-H-38534 test requirements	Subgroups (in accordance with MIL-H-38534, group A test table)
Interim electrical parameters	- - -
Final electrical test parameters	1*, 2, 3
Group A test requirements	1, 2, 3, 4, 5, 6
Group C end-point electrical parameters	1, 2, 3

* PDA applies to subgroup 1.

b. Burn-in test, method 1015 of MIL-STD-883.

- (1) Test condition A, B, C, or D. The test circuit shall be maintained by the manufacturer under document revision level control and shall be made available to either DESC-EC or the acquiring activity upon request. Also, the test circuit shall specify the inputs, outputs, biases, and power dissipation, as applicable, in accordance with the intent specified in test method 1015 of MIL-STD-883.
- (2) T_A as specified in accordance with table I of method 1015 of MIL-STD-883.

c. Interim and final electrical test parameters shall be as specified in table II herein, except interim electrical parameter tests prior to burn-in are optional at the discretion of the manufacturer.

4.3 Quality conformance inspection. Quality conformance inspection shall be in accordance with MIL-H-38534 and as specified herein.

4.3.1 Group A inspection. Group A inspection shall be in accordance with MIL-H-38534 and as follows:

- a. Tests shall be as specified in table II herein.
- b. Subgroups 7, 8, 9, 10, and 11 shall be omitted.

4.3.2 Group B inspection. Group B inspection shall be in accordance with MIL-H-38534.

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4.3.3 Group C inspection. Group C inspection shall be in accordance with MIL-H-38534 and as follows:

- a. End-point electrical parameters shall be as specified in table II herein.
- b. Steady-state life test, method 1005 of MIL-STD-883.
 - (1) Test condition A, B, C, or D. The test circuit shall be maintained by the manufacturer under document revision level control and shall be made available to either DESC-EC or the acquiring activity upon request. Also, the test circuit shall specify the inputs, outputs, biases, and power dissipation, as applicable, in accordance with the intent specified in test method 1005 of MIL-STD-883.
 - (2) T_A as specified in accordance with table I of method 1005 of MIL-STD-883.
 - (3) Test duration: 1,000 hours, except as permitted by method 1005 of MIL-STD-883.

4.3.4 Group D inspection. Group D inspection shall be in accordance with MIL-H-38534.

5. PACKAGING

5.1 Packaging requirements. The requirements for packaging shall be in accordance with MIL-H-38534.

6. NOTES

6.1 Intended use. Microcircuits conforming to this drawing are intended for original equipment design applications and logistic support of existing equipment.

6.2 Replaceability. Microcircuits covered by this drawing will replace the same generic device covered by a contractor-prepared specification or drawing.

6.3 Configuration control of SMD's. All proposed changes to existing SMD's will be coordinated with the users of record for the individual documents. This coordination will be accomplished in accordance with MIL-STD-973 using DD Form 1692, Engineering Change Proposal.

6.4 Record of users. Military and industrial users shall inform Defense Electronics Supply Center when a system application requires configuration control and the applicable SMD. DESC will maintain a record of users and this list will be used for coordination and distribution of changes to the drawings. Users of drawings covering microelectronics devices (FSC 5962) should contact DESC-ECT, telephone (513) 296-6047.

6.5 Comments. Comments on this drawing should be directed to DESC-ECT, Dayton, Ohio 45444, or telephone (513) 296-5373.

6.6 Approved sources of supply. Approved sources of supply are listed in QML-38534. Additional sources will be added to QML-38534 as they become available. The vendors listed in QML-38534 have agreed to this drawing and a certificate of compliance (see 3.7 herein) has been submitted to and accepted by DESC-ECT.

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STANDARD MICROCIRCUIT DRAWING SOURCE APPROVAL BULLETIN

DATE:

Approved sources of supply for SMD 80014 are listed below for immediate acquisition only and shall be added to QML-38534 during the next revision. QML-38534 will be revised to include the addition or deletion of sources. The vendors listed below have agreed to this drawing and a certificate of compliance has been submitted to and accepted by DESC-EC. This bulletin is superseded by the next dated revision of QML-38534.

Standard microcircuit drawing PIN	Vendor CAGE number	Vendor similar PIN <u>1/</u>
8001401ZX	23223 51651 64762	CTS0033ZB MSK0033B ELH0033G/883B

1/ Caution. Do not use this number for item acquisition. Items acquired to this number may not satisfy the performance requirements of this drawing.

Vendor CAGE number

Vendor name and address

23223

CTS Microelectronics
1201 Cumberland Avenue
West Lafayette, IN 47906

51651

M. S. Kenndy
8170 Thompson Road
Cicero, NY 13039-9393

64762

Elantec, Incorporated
1996 Tarob Court
Milpitas, CA 95035

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